#12 Declaration 6/16/04 as

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.	:	09/755,752	Confirmation No.	3897
Applicant	:	WILLIAMS		
Filed	:	January 5, 2001		
TC/A.U.	:	2684		
Examiner	:	NGUYEN, Tu		
Docket No.	:	6785-0120		
Customer No.	:	39207		

Certificate Under 37 CFR 1.8(a)
I hereby certify that this correspondence is being transmitted, via facsimile, 703-872-9306 to the U.S. Patent and Trademark Office on 6/10/04.

Terry W. Forsythe, Reg. No. 47,569

DECLARATION UNDER 37 C.F.R. §1.131

Via Facsimile 703-872-9306
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I declare:

1. I am the named inventor of the subject matter claimed in the above-captioned application.

2. I have read the Office Action mailed March 10, 2004, and the references cited therein.

3. I conceived the above-entitled invention in the United States prior to the June 9, 1999, filing date of U.S. Patent No. 6,300,881 to Yee, et al. Further, I developed the invention with due diligence until actual reduction to practice.

4. Attached as Exhibit A is a copy of the Invention Disclosure form that shows the invention was conceived at least as early as May, 1999.

5. Declarant further states that all statements made herein of his own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under §1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

6/10/04
Date

Terry L. Williams

FOR LEGAL DEPT. USE ONLY
Docket No. P0155

INVENTION DISCLOSURE FORM

Please type or print the requested information and complete all items. If an item is inapplicable, please answer "N/A". If an item calls for information unknown to you, please answer "Unknown".

1. Title of Invention Packet Based Backhaul Channel Configuration for a Wireless Repeater.

2. Inventor Name(s) Terry L. Williams

3. For each product in which the invention has been or is expected to be used, list the product model number or project name and the earliest date on which the product was or is expected to be shown to anyone outside the Company or offered for sale to the public.

The AirNet® BTS product line includes the AirSite® Base Station which is a high-power repeater-translator. It has been successfully demonstrated to provide low-cost RF coverage solutions in low-subscriber-density areas, which is AirNet®'s present target market. The AirSite® Base Station has been successfully deployed in commercial service in the United States using the GSM-1900 standard. It has also been developed for the GSM-1800 and GSM-900 standards. The GSM-1900 and GSM-1800 versions are currently offered for sale and have already been sold to a number of AirNet® customers.

The current AirSite® Base Station product configuration allows only one AirSite® Base Station to transmit information along a given RF backhaul channel to an AirNet® BTS. As such, the number of AirSite® Base Station that can be employed to support an AirNet® BTS is limited because there are a finite number of RF transmission channels allotted to an AirNet® BTS for use as RF backhaul channels in connection with AirSite® Base Stations.

EXHIBIT A

7. List the first person to whom the invention was disclosed or explained and the date of such disclosure.

Terry L. Williams first disclosed the idea of using a packet-based backhaul link for connecting a Digital AirSite® Base Station with an AirNet® BTS during concept discussions for the Digital AirSite® Base Station during May and June 1999.

9. Briefly describe the technical problem(s) solved by the invention and the application(s) in which the invention may be used.

Conventional telephone voice networks do not make efficient use of the bandwidth allocated to them. This inefficient use of bandwidth is also the case with cellular mobile communications networks. For example, AirNet Communications Corporation of Melbourne, Florida produces cellular base stations and translating wireless repeaters for use in continuous voice-signal cellular communications. These products include, among other things, the AirSite® translating wireless repeater, which is used in conjunction with AirNet's Base Transceiver Station (BTS) products.

The current AirSite® product is connected to the BTS via a wireless backhaul channel, over which the AirSite® product transmits information to the BTS on the uplink and receives information from the BTS on the downlink, respectively. The backhaul channel used by the current AirSite® product operates using circuit-switched technology, meaning that a call received by the AirSite® product from a mobile station and transmitted on the uplink to the BTS requires the allocation, by the BTS, of at least a portion of the bandwidth of the backhaul channel to that call for the entire duration of the call.

Since the backhaul connection between the AirSite® product and the BTS is a full duplex connection, the BTS allocates a portion of the bandwidth of the backhaul channel individually for each of the uplink of call traffic information from the AirSite® product to the BTS and the downlink of call traffic information from the BTS to the AirSite® product for the duration of the call. This means that while information is being sent from the mobile station to the AirSite® product and the BTS, bandwidth of the backhaul channel is also allocated to the recipient of the call for transmitting information of their own -- even if the recipient is merely listening to the information that they are receiving from the caller at the time. Generally, in the case of voice

networks, information will only be transmitted along the allocated bandwidth of the backhaul channel about 50% of the time. For example, when two people have a conversation, one person speaks and the other listens, and vice versa. People having a conversation do not generally speak at the same time.

If other traffic information, such as traffic information from another AirSite® product could be transmitted over the backhaul channel during periods in which the allocated bandwidth of an initiated call was unused, *i.e.*, the recipient of the call is listening, the efficiency of the transmission of voice information over the backhaul channel could be greatly increased – on the order of approximately 50%, for example.

10. Briefly describe how the invention solves the problem(s) identified in item 9 (attach additional sheets and drawings) and specifically indicate what you believe to be novel about the invention.

AirNet Communications Corporation is currently in the process of producing a digitized version of their AirSite® product. The Digital AirSite® product can potentially convert the circuit-switched transmission of continuous voice-signal traffic information received from the mobile station into packet-based traffic information for transmission to the BTS on the uplink of the backhaul channel, and for transmission from the BTS to the Digital AirSite® product on the downlink of the backhaul channel.

The packet based transmission of this traffic information can be performed in much the same manner in which packet-based information is currently transmitted in voice over IP networks. The use of packet based transmission of traffic information can allow multiple Digital AirSite® products to use the same backhaul channel for transmitting to, and receiving from, the BTS. Using this packet based transmission, the BTS will be accessed by a Digital AirSite® product that is requesting to transmit call information to the BTS. If the BTS is not receiving information from another Digital AirSite® product on the same backhaul channel at that time, then it can instruct the requesting Digital AirSite® product to begin transmitting packets of this call information. The BTS can also instruct the Digital AirSite® product to transmit only a portion of the packets of call information that it is currently seeking to transmit, and to wait to transmit any additional packets until it is further instructed to do so – effectively queuing the transmitting Digital AirSite® product until further notice. This queuing will allow the BTS to receive packets, and thus call information, from multiple Digital AirSite® products in a manner in which no Digital AirSite® product is made to wait for an extended period of time.

For example, in the current AirSite® product/BTS configuration, the AirSite® product transmits a Random Access Channel (RACH) burst to the BTS, identifying that the AirSite® product has information that it desires to transmit to the BTS over the backhaul channel. In response to this RACH burst, the BTS transmits a Paging and Access Grant Channel (PAGCH) burst to the AirSite® product identifying to the AirSite® product that it should set itself to a Standalone Dedicated Control Channel (SDDCH) and await further instructions. This SDDCH is a waiting area where the AirSite® product waits to be told by the BTS to which Traffic Channel (TCH) the AirSite® product should transmit information. This TCH is then held exclusively by the AirSite®

product during the duration of the call for which it is transmitting and receiving call information, even if the AirSite® product is not transmitting information or receiving information for that call at a specific time.

In the Digital AirSite® product/BTS configuration, the Digital AirSite® product transmits a RACH burst to the BTS, identifying to the BTS that the Digital AirSite® product has information packets that it desires to transmit to the BTS over the backhaul channel. In response to this RACH burst, the BTS transmits a PAGCH burst to the Digital AirSite® product identifying to the Digital AirSite® product that it should set itself to a specific TCH. Once at the TCH, the Digital AirSite® product can begin transmitting packets of information to the BTS. While the Digital AirSite® product is set to the TCH, the BTS can instruct the Digital AirSite® product to withhold the additional transmission of information packets until further notice. The BTS can then instruct a different Digital AirSite® product to begin transmitting information packets on that same TCH, and can instruct the original Digital AirSite® product to complete its transmission of information packets after the different Digital AirSite® product has completed its own transmission.

The ability of the BTS to stop the transmission of information packets by the Digital AirSite® product, and to instruct the Digital AirSite® product to temporarily discontinue the completion of this transmission until further notice, allows for not only a more efficient use of the bandwidth of the backhaul channel connecting the BTS to the Digital AirSite® products, but also allows for the immediate prioritizing of call traffic by the BTS without the loss of transmitted information. Currently, if an AirSite® product transmitting a higher priority were to seek access to the BTS, the BTS would terminate the connection between the BTS and another AirSite® product transmitting a lower priority call if it had no other TCH's to allocate to that high priority call. The termination of this connection with the other AirSite® product would cause a loss of all of the information being transmitted and received by the AirSite® product. In the case of packet-based transmission of information over the backhaul channel, the BTS can simply queue the transmission of the remaining, lower priority information packets until the completion of the transmission of the high priority call. This queuing may cause a delay in the transmission of information, but it will not cause a complete loss of this information.

The packet-based transmission of information along the backhaul channel may also be used in conjunction with other methods of increasing the efficiency of the backhaul channel. For example, the Digital AirSite® product can modulate and demodulate signals, allowing for the call information received by the Digital AirSite® product from the mobile station to be retransmitted to the BTS at a higher modulation scheme. This can allow call information received mobile stations and retransmitted by multiple Digital AirSite® products to be transmitted to the BTS over the same backhaul channel (as less bandwidth is needed by each Digital AirSite® product for transmitting the call information). Additionally, the call information transmitted by the multiple Digital AirSite® products can be converted into information packets, allowing even more Digital AirSite® products to concurrently use the same backhaul channel frequency to transmit information to the BTS and receive information from the BTS.

11. List the primary advantages or improvements of the invention over the best-known alternative.

When using the current RF backhaul channel configuration of the AirSite® Base Station, the AirNet® BTS has a finite number of RF traffic channels that it can allocate for use as backhaul channels, thus limiting the number of AirSite® Base Stations able to support that AirNet® BTS. The advantages allowing the number of AirSite® Base Stations supporting the AirNet® BTS to be increased are spelled out above.

12. List any patents or other printed publications that disclose prior art related to the invention.

There are presently no known patents, publications, or prior art related to this invention.

Terry L. Williams 12/22/99
Date

Explained to and understood by: _____ 12/22/99
Witness' Signature Date